Telecom Infrastructure and Service Development

Vermont has achieved universal telephone service and has built an infrastructure to support it. The telecommunications network that will meet the needs of Vermont's society and economy going forward must support a range of telecommunications services—high-speed data services, mobile services, as well as traditional voice and video. It must do so affordably and over a network that is inherently reliable. Vermont must find new ways to accelerate infrastructure development and encourage the introduction of new services. This will include mitigating obstacles that range from low customer density and incomplete customer awareness of services to capital availability and lengthy regulatory review processes. To have robust telecommunications networks that provide an array of telecommunications services requires both a ready supply of service and the demand that will support the providers who serve Vermont. This section deals with policies and actions that will help improve the telecommunications marketplace in Vermont and help Vermonters apply the tools of telecommunications to their lives.

GOALS

Vermont should seek a high standard of quality in its telecommunications infrastructure. To this end, it is important to describe what such an infrastructure would look like. This is especially difficult in the fast-changing realm of telecommunications where today's high speed is tomorrow's slow lane. There are general characteristics of a high-quality infrastructure that change more slowly. In laying out these characteristics, it is useful to divide networks conceptually into several pieces. The "last mile" or "distribution" infrastructure connects end users to local sites (like central offices, cable headends or hubs, cellular sites, wireless and other forms of access points) where service providers focus their local equipment. The "middle mile" or "transport" infrastructure connects these local access points in networks that reach through the state or its immediate region. The "first mile" or "backbone access" infrastructure provides Vermont's connections to the long-haul telecommunications networks of the country and the world. In addition, there are distinct desirable characteristics of those parts of Vermont's telecommunications networks that serve not fixed locations, but mobile services. Each of these conceptual pieces of the network has a set of desirable characteristics that Vermont should seek to achieve and maintain.

"Last mile" (or "distribution") infrastructure should:

- be universally available;
- support widespread use of high-speed packet data services by consumers throughout the state;
- have a clear migration path to support ever higher speeds as needed;

- be designed to readily support a variety of services offered by a variety of service providers, either through one or multiple sets of physical facilities.

These characteristics ensure that Vermonters will have access to new and emerging telecommunications services and will have options for how those services will be used to their benefit.

"Middle-mile" (or "transport") infrastructure should:

- reach all key locations in the state;
- be evolving so as to be moving closer to customers;
- use redundant routes and have physical redundancy from multiple carriers;
- be readily scalable;
- serve a variety of service providers.

These characteristics provide fair access to all regions and locales in the state, promote reliability, and are consistent with a competitive telecommunications market.

"First mile" or "backbone access" infrastructure should:

- provide ways to enter or exit the state over facilities from multiple regions of the state;
- use redundant routes and have physical redundancy from multiple carriers;
- be readily scalable;
- serve a variety of service providers.

These characteristics stress reliability and ready access to the robustly competitive telecommunications marketplace beyond Vermont's borders.

Mobile wireless services should:

- be available continuously along Vermont's principal numbered interstate, U.S. and state highways, and in all significant concentrations of population;
- be available in all regions of the state from at least three service providers;
- support emerging packet-data based services commonly found around the country, as well as voice.

These characteristics are important if users are to perceive Vermont's wireless services as dependable, up-to-date, and competitive.

In addition, it is important that all levels of Vermont's telecommunications infrastructure be in good repair and dependably maintained.

SPECIFIC DESIRED IMPROVEMENTS

When comparing these general goals against technology trends described in Section 1 of the plan, against service availability data found in Section 3 and against proprietary network information provided by telecommunications service providers, a number of desirable improvements come to light in each of the four conceptual pieces of Vermont's telecommunications infrastructure. Each of these specific improvements would represent clear and meaningful progress toward the goals of the plan.

Last mile improvements:

- Consumer-grade and small-business-grade broadband services including Digital Subscriber Line (DSL) or cable modem services and comparable services available to 90% of homes and businesses that have access to a telephone by 2007.
- Access to a packet-based, mass-market broadband infrastructure for all homes and businesses that have access to a telephone by 2010.

These improvements are important milestones on the road that leads to the new universal service, as described in Section 5.

Middle mile improvements:

- Route diversity for voice and data traffic carried between all local exchange company central offices, such that local areas are not isolated by single cable cuts or equipment failures.

This improvement is essential for Vermont to insulate itself from regional network failures that endanger business and economic activity as well as the public's safety. Much of Vermont's telecommunications network already meets this standard but it should be consistently met throughout the entire state.

First mile improvements:

- An additional route-redundant, carrier-neutral, high-capacity fiber optic link via southwest Vermont to Albany.
- An additional route-redundant, carrier-neutral, high-capacity fiber optic link from Vermont to Quebec.

These routes will increase the diversity of the small number of large

What is "broadband?"

The goals of this section purposely do not provide a specific numerical definition for the term "broadband" because the meaning of this term will evolve as data networks nationwide and around the world offer more and more capability to their users. Networks in Vermont must also be capable of evolving to keep up with this progress. Currently, the Federal Communications Commission (FCC) defines "high-speed services" as those having a data transmission capability of at least 200 kbps in one direction, and "advanced services" as those having a data transmission capability of at least 200 kbps in two directions. In Vermont in 2004, broadband services sold to residential users often have maximum download speeds in excess of 1 or even 2 Mbps, while upload speeds are usually lower, around .5 Mbps or even less.

It is important to recognize that Vermont needs not just a single type of broadband service but a family of service tiers capable of meeting the needs of various users affordably. In particular small business users may need services that offer bandwidth that is high in both upstream and downstream directions, and not just asymmetrically high. Small business and some other users may also require that their broadband services support certain features that increase the usefulness of the service, such as the ability to support servers, and the ability to connect the service to a Local Area Network (LAN).

voice and data pipes that connect Vermont to the outside world. They will also provide Vermont companies with greater access to a wider range of national and international backbone providers at the favorable rates in these markets.

Mobile wireless improvements:

- 100% handheld phone coverage along all interstates, plus Routes 2, 4, 7, and 9 on both the GSM/GPRS and CDMA digital standards by 2007.
- 100% handheld phone coverage on all numbered state highway routes on both the GSM/GPRS and CDMA digital standards (or their successors) by 2010.
- Reasonably priced mobile walkabout "Wi-Fi" in all designated downtowns, all highway rest areas, welcome centers, and in significant resort locales.

These improvements represent a minimum level of mobile wireless service that will be required to send the message that Vermont is "open for business" to local businesses, businesses considering locating in Vermont, and the traveling public. They will help send the message that Vermont has a modern, capable telecommunications infrastructure. Anything less will cause users repeated frustration and tar the state with a reputation of technological backwardness.

This list is not intended to be an exhaustive list of desirable improvements to Vermont's telecommunications infrastructure. Nevertheless, these improvements would be tangible benefits for the state. There is no one way to achieve all of these specific improvements—there will be a variety of applicable tools. Initia-

Leadership for Infrastructure Advancement

In 2003, Governor Douglas, by Executive Order 15-03, directed the Agency of Commerce and Community Development to be the Agency responsible for statewide leadership to address expansion of Vermont infrastructure for wired and wireless voice and broadband communications, and created a Telecommunications Advisory Council to assist the Agency in this role. In 2003, the Agency also created the position of Director of Telecommunications Infrastructure Advancement to serve as the point person for its activities in this area.

The Executive Order directed the Agency to perform the following functions:

- Lead the effort to create the vision for Vermont's telecommunications infrastructure, and establish goals and objectives to achieve the vision, in coordination with the Department of Public Service's Telecommunications Plan, and in conjunction with key stakeholders;
- Develop a work plan with activities, milestones and identification of the entity or individual responsible for achieving the goals and objectives and provide strategic planning and annual review of such plan to ensure accountability, including goal setting and ongoing measurement and reporting of milestones and accomplishments;
- Coordinate activities and initiatives among state agencies and departments, non-government groups, regional partners and other key stakeholders to ensure ongoing collaboration of efforts around telecommunications development throughout Vermont (including encouraging the involvement of local communities and regions of the State as appropriate and necessary);
- Research and benchmark best practices in other states and communities and be the central repository of knowledge on telecommunications-related activities and projects for both the demand and supply sides in Vermont;
- Identify activities requiring funding to advance the State's telecommunications objectives, and work to secure available private, state, and federal funding;
- Recommend legislative and administrative policies that will support the development of quality telecommunications infrastructure and services in Vermont, and advise the Governor and cabinet members on matters of telecommunications policy;
- Serve as a primary point of information and guidance for the Administration and the Department of Information and Innovation on telecommunications policy; and
- Work with State communications and public relations resources to develop marketing and outreach materials in order to communicate the need for, and the potential of, a competitive telecommunications infrastructure in Vermont and the State's telecommunications needs, resources, initiatives and accomplishments.

Assignment of this role to the Agency and creation of the Director position are instrumental parts of accomplishing many elements of this plan, especially the elements of this Section.

tives that can achieve these specific ends should receive special consideration in a range of venues including alternative regulation plans, other utility regulatory proceedings, loan and grant programs, land use planning and regulation, state purchasing, capital budgeting, and demand aggregation and stimulation programs.

FINANCING INFRASTRUCTURE AND SERVICES

Financing continued progress in modernizing Vermont's telecommunications networks is a significant investment, one that will continue to be financed primarily with private dollars. Government involvement should complement and leverage this private sector funding. Providing assistance that helps service providers finance capital improvements to deliver better telecommunications infrastructure and services addresses a key challenge that many service providers face.

Providing financial assistance is in some cases a question of using existing resources better. The federal government has a number of programs to provide support for rural telecommunications that are underutilized in Vermont. New state resources are also coming on line. This includes the Vermont Economic Development Authority's (VEDA) Technology Infrastructure Financing Program. Both for-profit and non-profit entities will be eligible to borrow from this fund for a variety of purposes including the purchase of customer premise equipment, the construction (including upgrading) of new communications infrastructure, and the installation of equipment to bring the network online. Other possible sources of funding to assist the development of telecommunications infrastructure are traditional community and economic development sources, such as Community Development Block Grants (CDBG) and the U.S. Department of Commerce Economic Development Administration (EDA) grants. The fact that these programs serve a variety of needs limits the extent to which they can be used for telecommunications. Nevertheless, as the importance of telecommunications grows in the economy and the community of Vermont, it makes sense to treat telecommunications as an infrastructure on par with the other types of infrastructure on which these programs have traditionally focused.

There may be some instances where private sector dollars to build the networks Vermont needs are not forthcoming, or not forthcoming in a timely manner. In those instances, direct public investment may be a necessary tool, but private investment is preferred. If there is direct public ownership of pieces of Vermont's telecommunications network, its most important role should be to facilitate the financing of an open-access telecommunications platform that can still be used by various private sector businesses to provide service to customers.

Policies

- The participation of state, regional, and local economic and community development organizations and programs in providing financing assistance for telecommunications infrastructure is supported.
  - Economic and community development assistance should not be used to displace private investment but should be used to enhance access by private service providers in hard-to-serve areas.

- Private sector investment is preferred as the primary source of funding improvements to telecommunications networks in Vermont. Direct public investment by the state in building common carrier telecommunications networks should be an option where private sector investment has failed to meet state and community needs and is likely to continue to do so.
  - If there is direct public ownership of pieces of Vermont's telecommunications network, it should be structured so as to maximize the opportunities for private sector providers to offer services to users over the network on an open basis.

Strategies/Action Plans

- The Agency of Commerce and Community Development (ACCD) should periodically inventory the variety of state and federal telecommunications funding opportunities that are available. This includes, but is not necessarily limited to, the U.S. Department of Agriculture's Rural Broadband Loan and Grant Program, the Rural Telephone Bank, federal universal service programs, and the VEDA Technology Infrastructure Financing Program.
  - ACCD should benchmark the extent or percentage of available funds awarded to Vermont as an indicator of the state's success.
- ACCD should strive to create financial incentives that will improve the return on investment for service providers in rural areas. This should include at a minimum tax policies in line with those outlined in Section 5.
  - ACCD should periodically monitor the effect of any financial incentive to ensure that the desired outcome is being achieved.
- ACCD should establish or provide support for a process to solicit private sector service to meet needs in unserved or underserved communities in Vermont that can be used prior to concluding direct public investment is needed as a financing tool.
- ACCD should examine efforts that have been implemented in other states and jurisdictions for models of how the public sector can support investment in telecommunications infrastructure.

COMMUNITY AGGREGATION

Simply put, aggregating demand is "building the market." The goal of any aggregation strategy is to create market demand sufficient to attract investment by telecommunications service providers without having to rely on public infrastructure investment. For a telecom provider, organized demand creates access to a customer base that represents real value. One Vermont-based service provider recently placed the value of demand aggregation, through marketing savings, at approximately 15-20% of the total cost of a new telecommunications initiative. In addition, the cost savings are comprised largely of up-front costs. The ability to demonstrate demand means that obtaining financing, especially in a tight capital market, becomes less daunting. An aggregate can serve as a "market-maker" even in a region short on competitive market choices.

While not a panacea, community aggregation can complement actions called for elsewhere in the plan including loan and grant programs, marketing, and

using state purchasing to create incentives or assistance for service providers to bring service to underserved areas. Community aggregation requires significant investments of time by people "on the ground" in local communities, performing the kind of labor-intensive identification of users that can be prohibitively expensive for service providers. Municipalities and other local organizations can take the lead in these efforts, or be part of a coalition of local partners. State-level organizations such as ACCD, the Vermont Broadband Council, and the Vermont Council on Rural Development (VCRD) can add value by coordinating the work that goes on in various communities, providing a road map, professional assistance, and resources about potential users and providers across multiple towns. The state has already provided support for the VCRD's community aggregation effort through the 2003 capital budget. This effort is an excellent foundation on which to build further efforts.

Policy

- The state should support community aggregation projects in underserved communities.
- Municipalities are encouraged to be partners in community aggregation efforts.

Strategies/Action Plans

- As state funding opportunities become available, the state should seek to provide sufficient funds through ACCD or another agency to expand aggregation to at least several community aggregation projects in underserved rural communities in the next year of a program in addition to those already underway.
  - The VCRD or a similarly qualified organization should oversee the program and assist local communities organize efforts. Regional Planning Commissions (RPCs) should provide assistance in their respective regions.
  - The program should verify that the money provides significant successful outcomes in the communities through attracting additional new or lower-cost services to those targeted communities.
  - If the program continues to be successful, the state should fund additional communities in subsequent years until last mile infrastructure goals are met.
- ACCD should help publicize an on-line registry, such as the one maintained by the VCRD, where unserved potential users of broadband and wireless telecommunications services can register their desire to obtain service and their willingness to be contacted.

RIGHT-OF-WAY ACCESS

Access to rights-of-way (ROWs) represents a key element of telecommunications infrastructure development. Continuous rights-of-way are difficult to assemble, therefore once assembled, holders are often in a position either to be catalysts for telecommunications service or alternatively to slow its progress. It is in the public interest that telecommunications and cable TV services face

minimal barriers to use of public rights-of way. Recent efforts by the Public Service Department (PSD) and the Public Service Board (PSB) to improve the rates and other terms and conditions faced by new attachers to utility poles were an important step forward. (See also the subsection, "Pole Attachment Policy" in Section 8, "Regulatory Policy.") Cost-effective access to transportation ROWs is also beneficial.

The price of access to state transportation ROWs by telecommunications service providers varies. Prices for highway ROWs are favorable. State policy has allowed telecommunications infrastructure in highway ROWs and has not required a lease payment to the state for telecommunications utilities to use highway ROWs. On the other hand, there has been a lease payment required on state-owned rail systems. State law directs the Vermont Agency of Transportation (VTrans) to seek fair market value for leases of state-owned railways, although it allows the Agency to bargain for less than fair market value when the proposed use serves a public purpose. Access to state-owned railways may in some cases be complicated by the fact that the state has leased the railway to private railroads, along with the right to bargain for ROW access; the state only receives a share of the lease payment that the private railroad negotiates with a telecommunications company. Nevertheless, the state should seek to do what it can to maximize the opportunity that rail as well as highway ROWs provide to promote the development of telecommunications infrastructure.

Beyond addressing the lease payments collected from telecommunications service providers for access to utility poles, railways and roads, there may be additional opportunities for state and municipal agencies to lower the cost of infrastructure deployment over the long run. Construction and major maintenance of roads or other infrastructures in the roadway (such as water or sewer lines) sometimes represent special opportunities to provide for present or future communications infrastructure through the laying of conduit while other work is being done. When other work is being done may often be the most cost-effective time to install conduit, and it is usually less expensive to install fiber optic facilities into available conduit than it is to dig a fresh trench or replace utility poles to create additional space. Laying conduit along or in roadway may also have additional benefits besides cost. It may facilitate the future development of Intelligent Transportation Systems (see the "Two Agencies with Expanding Needs" subsection of Section 2, "Initiatives and Activities."). Having conduit available also facilitates underground placement of communications utilities, which has aesthetic benefits. It will take time to create a significant amount of useful conduit, and road work schedules may dictate that the opportunities to place conduit inexpensively are significantly in advance of when it is used. This means that placement of conduit should be part of a long-term, incremental program. Placement of conduit may not always be advisable, but identifying the opportunities to place conduit cost-effectively is a prudent step.

Policies:

- Access for telecommunications projects to publicly owned rail and highway ROWs where space and safety requirements permit is in the public interest and encouraged when the facilities provide service to the public in Vermont.

- Such ROW access should not be seen as a net revenue generator, and the state and municipalities should not seek payments, except to defray costs of installation. In lieu of other compensation the state may seek concessions to provide service or facilities to the state or additional service to communities.

Strategies/Action Plans:

- ▶ VTrans and municipal highway departments should evaluate, with advice from ACCD and the PSD, the circumstances under which they should install conduit to support fiber optics when construction, excavation or major maintenance of highways or local roads provide the opportunity to do so.

"HOT SPOT" PLANNING AND DEVELOPMENT

While areas that lack service or are underserved are a special concern, there are many well-served locations throughout the state. Nurturing and publicizing the locations in Vermont that have special telecommunications amenities is important to the telecommunications development of the state. Providing high-quality, robust telecommunications service should not be a matter of favoring one area over another. Businesses and other activities that rely on telecommunications are found in all corners of the state. Nevertheless, there are certain locations where a special effort to ensure a high level of telecommunications service is worthwhile. These include business and industrial parks and commercial centers. Now and in the future, the attraction of sites like these to businesses will be limited without ready access to wired and wireless telecommunications services. Downtowns and resort areas are another area of special concern. Many of these areas (especially downtowns) tend to be the centers of local telephone, wireless, and broadband services. The explosion of Wi-Fi and other mobile wireless Internet technology is changing the expectations of tourists and shoppers around the country. High-speed access to the Internet is an amenity that increasingly users will not want to leave at home or the office, making it an emerging "must have" for many spots that seek to attract large numbers of visitors.

Policies

- ▶ Planning and economic development organizations that develop or plan for the development of business and industrial parks should coordinate with ACCD, the PSD, and local service providers to better understand present and future telecommunications options available at potential sites.
  - Business and industrial parks should include prudent provisions for future expansion of telecommunications service, such as spare conduit.
- ▶ All downtown and resort areas, working through local downtown associations, chambers of commerce, municipalities, or Regional Planning Commissions, should ensure that wireless Internet access amenities are offered by a service provider in areas frequented by visitors.

Strategies/Action Plan

- ▶ The state should offer wireless Internet access to travelers at highway rest areas.

WIRELESS SERVICE DEVELOPMENT

WIRELESS PERMITTING

The permitting system that has been in place for wireless infrastructure since the mid-1990s has had both success and failure. It has been very successful at protecting the Vermont landscape from the worst examples of tower development. Wireless carriers have responded creatively by developing wireless service using existing structures or new structures cleverly designed to blend in with the Vermont landscape, for example appearing like farm silos. The slow pace and often uncertain outcome of proposals for new development has contributed to wireless networks in Vermont that are often spotty (or absent in many rural areas) and slow to respond to growth in usage or demand for new services. During the period since the last plan in 2000, Vermont saw an active period of proposals for the deployment of new wireless infrastructure due in part to financing obtained from capital markets at the tail end of the telecom boom and in some cases build-out deadlines for new FCC licenses. Many proposals failed to pass through the process in time for Vermont to realize the full benefit (in terms of new services and expanded service) of this period of heightened interest. The new service providers who entered the market provided competitive pressure to cut rates and introduce new services like wireless e-mail and Internet. Vermont cannot depend on a similar level of investment interest in the near future. Only recently have capital markets regained some of the past optimism on the telecom industry. It is likely that investors will be most attracted to wireless investments that are relatively certain and can earn a return in a relatively short period of time. Therefore it is important that Vermont have a wireless permitting environment that is competitive with that of other states.

At the same time, wireless infrastructure is growing in importance. No longer merely a toy, novelty, or niche product, wireless services are mainstream services and business tools. Wireless services bring Internet access to areas with few alternatives. By the end of 2004 it is likely that the majority of Vermont households will have a wireless phone. Wireless provides a key future competitor to incumbent telephone companies. Wireless technology also provides the opportunity for multiple companies to bring new choices to the wireless telephone and broadband Internet markets. Wireless technology is providing the opportunity for a number of small, Vermont based companies to enter the broadband Internet access market. PCS companies have brought more competition to traditional cellular companies. Wireless services are key to emergency services. About one-third of calls to 9-1-1 in Vermont are made on a wireless phone. As described elsewhere in the plan, public safety agencies are examining upgrades to mobile wireless services. Without wireless services people (especially those familiar with the explosive growth of wireless outside of Vermont) will not perceive Vermont to have a complete and modern telecommunications infrastructure. This will be an economic handicap. The challenge then is to establish clear paths to success for wireless infrastructure development that will also be acceptable to the larger part of the community.

A more wireless-friendly land-use policy need not result in an unattractive landscape. To significantly improve the quality and extent of wireless service in Vermont requires that policy within the state make it easier for service providers to identify and implement successful strategies that are acceptable to the community. Types of installations and site modifications that typically are approved must make it through the siting process in a short timeframe. Low-impact sites should face fewer levels of review. The wireless industry can also help communities better incorporate wireless service into planning by providing timely information about wireless coverage and gaps. In 2003, the Cellular Telecommunications and Internet Association (CTIA), a national wireless industry group, adopted a voluntary industry "Consumer Code." This code includes a provision that companies complying with the code will provide maps showing where service is generally available, using generally accepted standards and methodologies. This mapping provision should improve the quality of information generally available to the public about the extent of coverage.

Vermont must address the length of the process that even good proposals must face in Vermont if wireless providers are to respond well to meet the state's future needs. Many wireless facility developments must currently undergo multiple layers of review before construction. Legislation passed in the latter 1990s placed wireless developments even as short as 20 feet in height under Act 250 review. Since then, all communities have had the opportunity to develop local zoning that includes wireless development or to develop special ordinances on wireless development. Many communities have now exercised that authority. Vermont continues to need oversight of wireless development, but there may be procedural changes in permitting that can enhance service without harming environmental quality.

Policies

- Wireless telecommunications infrastructure is an important part of a complete telecommunications infrastructure in Vermont and is in the public interest.
  - It is desirable to have PCS and wireless broadband services available to Vermont communities, in addition to traditional cellular telephone services.
- All communities should ensure that local land-use regulations permit service providers to identify practical and economic ways to provide continuous mobile service along interstate, U.S. and numbered state highways, and within concentrations of population.
- All communities should ensure that local land-use regulations permit public safety agencies to identify practical and economic ways to provide continuous mobile emergency communications throughout populated areas.
- All communities should ensure that local land-use regulations permit service providers to identify practical ways to provide fixed wireless broadband service, including to sparsely populated areas.
- Vermont should continue to facilitate and encourage the use of existing facilities for siting antennas. Service providers should use pre-existing structures where available for deployment of antennas.

- Permitting authorities should strive to make requirements for use of pre-existing structures less burdensome than construction of new structures.
- Use of electric transmission structures for placement of wireless service antennas is specifically supported and encouraged in instances when such structures can provide coverage and not endanger electric safety and reliability.

▶ Service providers should not take any action that would discourage collocation by another service provider at sites they occupy. Owners of wireless infrastructure (for example, towers or other tall structures) are encouraged to allow collocation of multiple carriers to the extent practical.

▶ Tower developers and users should take reasonable steps to reduce the adverse visual impact of structures and should prefer sites with lower visual impact to high-impact sites.

Strategies/Action Plans

▶ ACCD, in conjunction with the Vermont League of Cities and Towns and the Vermont Association of Planning and Development Agencies, should produce an updated model zoning bylaw that contains examples of low-impact wireless installations that will expedite the permitting process.

▶ Due to the critical need to improve wireless service for public safety and for broadband deployment the state should strive for one permitting process for wireless siting. This may include Act 250 permitting for larger structures and local zoning for the sites with minimal environmental impact.

▶ Regional Planning Commissions should undertake a coordinated process of planning for wireless development in their regions.

- RPCs should maintain maps of existing wireless sites in their respective regions.
- To the best of their ability, utilizing coverage maps available from providers (such as maps produced under the CTIA "Consumer Code"), RPCs should create electronic maps that represent handheld coverage for their region, in the aggregate and by carrier.
- In areas with inadequate coverage, RPCs should identify preferred wireless sites, particularly in communities and along the state highways and the interstate.
- RPCs should assist their communities with the development and updating of zoning related to wireless development.

▶ ACCD should support some technical assistance to municipalities and RPCs who are planning for wireless service development.

STATE PROPERTY LEASING

In 1997, Act 48 was passed and was intended, in part, to improve the process for leasing state property for wireless antennas by making the Secretary of Administration the state's sole agent for leasing state buildings and lands for wireless facilities. The law established a Tower Siting Advisory Committee (TSAC) to advise on applications and create policies and a lease. The state's Chief Information Officer had been the Secretary's designee. The Secretary's authority was statutorily delegated to the Commissioner of Information and Innovation

when the Department of Information and Innovation (DII) was created in 2003. Although well intentioned, wireless carriers have at times viewed the process as a barrier. A significant issue has been the lack of time by experienced staff to work with potential lessees to address issues expeditiously. There are steps that the state could take to make this process work more smoothly and better achieve the legislature's intent.

Strategies/Action Plans

- TSAC should identify specific state sites on which wireless equipment location is encouraged and that will meet service providers' needs.
  - The state should contract with a vendor to market these sites to wireless service providers.
- DII should create a professional position to manage state radio and radio site assets, or contract for this with a professional management company.
- DII and TSAC should revise the standard state lease to be friendlier to lessees and encourage use of state property.

DEMAND STIMULATION

Demand and supply for advanced telecommunications services are linked. The more users who buy services, the lower the cost per user and the more economical it is to provide services. Likewise, the cheaper and more available services are, the easier it is for users to find those uses of the services that drive demand. There can be barriers to using new technology when it is unfamiliar and the advantages are not clear. Therefore, supporting those users who need help in discovering and applying beneficial uses of telecommunications technology helps all users by providing a broader base of support for the development of telecommunications networks and services.

APPLICATIONS EXTENSION

In its May 12, 2003 issue, BusinessWeek reported that U.S. productivity gains from e-business are 1%-3% annually—and may be headed up.

Information technology and communications are essential elements for virtually any business in today's and tomorrow's economies. Relationships with customers, suppliers, and business partners are increasingly accomplished on-line and with less and less regard to distance. Information and education that can help a business thrive is available through communications technology in ways it has not been available before. Information technology is driving productivity gains that sustain growth in the economy. Businesses that fail to use telecommunications and related technology well are at a distinct disadvantage. Yet one quarter of Vermont non-residential organizations surveyed by the PSD in 2003 (predominantly businesses) are not yet connected to the Internet, the basic communications tool of the on-line economy. More and more, this will be the equivalent of a business not having a telephone ten years ago.

Vermont has many very small businesses, and small businesses face special challenges in using technology well, even if they have access to it. While telecommunications technology should be important to nearly all businesses, few businesses are experts in it. Businesses who do not know how to apply technology to their businesses well are less likely to use high-speed telecommunications.

The fewer who use the technology, the less likely it is to be offered, or offered on favorable terms. The less it is offered, the fewer businesses will be exposed to its possibilities.

Vermont has a successful program for assisting manufacturers with manufacturing technology, management, processes, and best practices in the Vermont Manufacturing Extension Program (VMEC) based at Vermont Technical College. The impact of this program is detailed in VMEC's annual "Impact Report."[1] This program includes assistance to manufacturers on the subject of e-business. A similar program could help a wider range of Vermont small businesses.

The benefits of helping businesses with the application of telecommunications technology, both for the businesses and the development of the telecommunications marketplace in Vermont, were recognized in the *Vermont Telecommunications Plan* as early as its 1996 edition. This recognition led to early PSD and PSB support for the Vermont Telecommunications Application Center (later the Vermont Telecommunications Advancement Center, or VTAC). VTAC was never able to scale up to a program capable of reaching out to individual small businesses and over the last several years its activities were largely dictated by federal grant funding opportunities. VTAC closed its doors in June 2004, but it is appropriate to renew the focus on helping small business apply telecommunications and related technology to become more successful.

Strategies/Action Plans

- Through one of the state's institutions of higher learning Vermont should re-establish a program to provide assistance to Vermont businesses, especially small business, in understanding and adopting applications of telecommunications and related information technology that will help them improve productivity, reach new markets, or support jobs in Vermont. The program should involve these steps:
  - Associate the program with an existing program of extension to business at a Vermont higher educational institution.
  - Provide a sustaining level of on-going state funding for at least three years, then evaluate the level of success and need. Supplement with subsidized rates charged to businesses assisted.
  - Focus the program on business sectors or types where it can have the greatest impact with limited funds.
  - Assess the program's success by the number of businesses helped and estimates of new jobs created/existing jobs retained.
- Include in the program a technical support matching program to link Vermont businesses with a need for on-going technical support for telecom-dependent applications with appropriate vendors who can provide that service.
  - Encourage technical support vendors to provide discounted support during an initial period in exchange for referrals.

JOINT MARKETING PROGRAMS

Broadband telecommunications, like nearly every other new service, requires marketing to introduce consumers to the service and build demand. While a significant and growing number of Vermonters have already seen the value of broadband services, many are still holding back. This is neither surprising nor alarming. As discussed in Section 1, consumer products and services follow an adoption curve that starts out slowly and gradually builds as a greater and greater share of the population adopts the new technology. Getting past the initial period of low demand is a challenge for many parts of Vermont. Installing broadband service usually requires a significant up-front capital investment, which is only sustainable once a critical mass of customers is reached. In rural areas that critical mass may represent a much larger portion of the potential customers, meaning that service providers may have to wait longer to earn a return on investment. More quickly progressing along the technology adoption curve in rural areas will help Vermont reduce this obstacle. A more concerted effort to market broadband services will help reduce per-customer costs and develop a self-sustaining level of demand for broadband services.

An additional benefit of a marketing campaign would be to change some people's (inaccurate) perception of Vermont as a technology backwater. Although Vermont has challenges in making broadband telecommunications available everywhere, most Vermonters have access. This is not a reason to be complacent about those who don't, but the problem is not helped when potential customers in Vermont do not seek service because they think they can't get it, or when potential employers and telecommunications users from out-of-state avoid Vermont because of an impression they will not be able to obtain needed services affordably.

Strategies/Action Plans

- ACCD should fund a multi-media marketing campaign to promote the use and benefits of broadband service.
  - ACCD should seek to conduct its campaign with support from, and in cooperation with, providers of broadband service in Vermont including possible jointly sponsored messages.

(Endnotes)

[1] http://www.vmec.org/about/impact.php.